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AGRICULTURAL NEWS LETTER

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This publication contains information regarding new developments of interest to agriculture based on laboratory and field investigations by the du Pont Company. It also contains published reports of investigators at agricultural experiment stations and other institutions as related to the Company's products and other subjects of agricultural interest.

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Public Relations Department
E. I. du Pont de Nemours & Company (Inc.)

L. F. Livingston, Manager

Gus M. Oehm,
Agricultural Editor,
Wilmington 98, Delaware

M. H. Bruner, Extension Division, Du Pont Co., Clemson, S. C.

V. S. Peterson, Extension Division, Du Pont Co., Ames, Iowa

Du Pont Agricultural Advisory Board

W. H. Tisdale, Pest Control Research Section, Grasselli Chemicals Department

H. F. Dietz, Pest Control Research Section, Grasselli Chemicals Department

Gilbert F. Miles, Minquadale Research Laboratory, Semesan Section

M. F. Gribbins, Technical Service Section, Ammonia Department

D. C. Boughton, Veterinary Chemical & Animal Nutrition, Grasselli Chemicals Department

James Waddell, Biological Laboratory, Organic Chemicals Department

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"PARZATE" FUNGICIDE -- ONE PRODUCT FOR MANY PLANT DISEASES

Du Pont is producing a new fungicide, formulated for the convenience of growers who are looking for a single weapon to use against many diseases of numerous vegetables, fruits, and ornamentals. This new material not only controls many diseases, but can be mixed with DDT and other insecticides that control a large number of insects, as well.

Many serious plant diseases are effectively prevented through use of this one material, named "Parzate" fungicide, which contains 65 per cent zinc ethylene bis dithiocarbamate, 15.4 per cent of which is expressed as metallic zinc.

Used Against Both Early and Late Blights of Tomatoes and Potatoes

"Parzate" has a wide range of use, combining the effectiveness of several previously used fungicides. It was successfully used during the past growing season against late blight of potatoes and tomatoes. Late blight struck tomato crops without warning in 1946, causing more than 50 million dollars loss east of the Rockies. "Parzate" also gave excellent control of early blight of potatoes, and early blight and Septoria leaf spot of tomatoes without injury to the foliage.

Controls Numerous Ailments of Vegetables, Fruits, and Ornamentals

This new product has also proved effective against many diseases of other vegetables, fruits, and ornamentals. It is now recommended to control leaf blight diseases of celery; downy mildew and other leaf diseases of cucumbers, cantaloupes, and other cucurbits; rust and anthracnose of beans; downy mildews of spinach and beets; and azalea petal blight, snapdragon rust, and camelia blight. It has shown promise as an outstanding fungicide on other diseases, but additional experimental results are needed before general recommendations can be made for use in their control.

"Parzate" has natural adhesive properties on plants, so that under ordinary circumstances it is not necessary or desirable to add sticking or wetting agents, except on certain plants that are difficult to wet. Used as a dust, it mixes well with talc, pyrophyllite, or other suitable non-alkaline diluents. It is compatible with such insecticides as DDT, rotenone, pyrethrum, nicotine, and the arsenicals, and with other fungicides except coppers. Exceptionally high yields have been obtained with potatoes where "Parzate" was combined with "Deenate" DDT insecticides to give effective control of both insects and diseases.

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U. S. D. A. ANNOUNCES LAUNCHING OF ALL-OUT DRIVE AGAINST INSECTS, WEEDS, PLANT AND ANIMAL DISEASES, RODENTS, AND OTHER FARM PESTS

The U. S. Department of Agriculture has announced an all-out fight against insects, weeds, plant and animal diseases, rodents, and other farm pests as a further move to conserve and produce more grain and other food and feed crops to help hungry people abroad.

In a recent news release, the Department's Agricultural Research Administration, said: "The Department will seek the aid and cooperation of other agricultural groups such as farm organizations, colleges of agriculture, and trade organizations representing manufacturers of insecticides, fungicides, and other materials needed in the campaign.

"Department officials point out that much of the annual loss of 300 million bushels of stored grains now worth more than $600,000,000 can be prevented by the application of sound insect pest-control measures. Likewise, effective rodent-control measures can prevent much of the estimated annual destruction of an additional 200 million bushels of grain by rats.

"A recent survey indicated that up-to-date insect-control measures were in use for only 5 percent of the farm storage capacity. In spite of this situation, 97 percent of the corn, 60 percent of the wheat, and 94 percent of the oats are stored on farms at some time during the year.

"To provide for greater production of foods and feeds in this country, the Department urges greater use of pest-control measures for livestock and growing food crops. The effects of insects and other parasites on livestock now rob our animals of the benefit of one ear of corn out of every 10 fed. Control of these parasites will, therefore, stretch supplies of corn and other feeds.

"Cotton is the source of great quantities of vegetable oils, as well as much livestock feed in the form of cottonseed meal. Insects annually reduce the national cotton crop by 13 percent or more. One hundred million bushels of next year's corn crop may be saved from insects by applying methods to control the European corn borer, the Japanese beetle, the corn ear worm, and other insects. Likewise, 25 to 50 million bushels of small grains could be saved each year by applying known methods of insect control. Additional losses can be prevented by control of weeds and plant diseases.

"The Department, therefore, urges everyone concerned to cooperate in stimulating pest-control efforts to help produce and conserve all food possible."

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TOO MUCH GRAIN WASTED BY INSECTS, RATS, GRAIN WEEVILS, AND MOLDS

One way to increase the supply of grains for human food is to stop feeding so much of it to rats, grain weevils, and other insect pests, according to the U. S. Department of Agriculture. The Department estimates that insects cause the loss of at least 5 per cent of stored grain and cereal products every year. In a recent news release, the Department's Agricultural Research Administration, said:

"Rodents destroy another 4 per cent, according to reliable estimates. These losses are even more challenging when translated into grain and money. Insects are estimated to destroy over $350,000,000 worth of stored grains annually at 1945 prices, and rats and mice account for another $200,000,000 worth.

"While 100-per cent control of these wasters of human food is not regarded as practical, certain measures can be taken to materially decrease the losses. Reduction of moisture content, for instance, is one of the best ways of holding down losses from insects as well as molds and other spoilage organisms that attack grain in storage.

"Existing methods for prevention of losses of grain from insects and rodents are in use on farms to the extent of only 5 per cent of the storage capacity; and yet 97 per cent of the corn, 60 per cent of the wheat, and 94 per cent of the oats are stored on farms.

"New methods to aid in the control of insects that damage stored grain have been developed by the Bureau of Entomology & Plant Quarantine.

"Fumigation of farm-stored grain is practiced to some extent, but should be greatly increased. Improved storage facilities including tighter construction to permit more general use of fumigants are also needed."

U. S. D. A Includes ANTU Rodenticide for Control of Brown Rats

The government includes use of ANTU rodenticide among measures to be taken against rodents, pointing out that rat poisons containing ANTU are recommended for the control of brown rats. It also urges regular use of traps and other standard methods of control. It adds:

"Control measures taken by the general public to reduce the number of rats and mice in storage areas and provision of rodent-proof storage structures would contribute greatly to reduction of losses of grain from this source. It is also helpful to clean up piles of rubbish or old boards where rats might find shelter. Rat control is relatively easy on premises where 'good housekeeping' is practiced."

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ANTU - "PIED PIPER OF CHEMISTRY"

The average farm has between fifty and a nundred rats. They spread disease not only to human beings out to poultry and livestock. They kill baby chicks and full-grown hens. They eat and contaminate grain and other feed -- an expensive loss these days when livestock feeds cost more than ever before. A farmer can get rid of them and save money and food -- food the world badly needs.

Science now offers you new rat poisons containing Du Pont ANTU, a product of chemical research. It comes in three forms -- ready-to-use bait, powder, and paste. Any form can be safely and conveniently used by following directions. Farmers are urged to set out an adequate amount of bait to insure success.

FARMER KILLS RATS BY USING ANTU ON TOP OF FRESH-MILK BAIT

Hamburger, canned dog food, eggs, sausage, liver, bacon, fish, peanut butter, cheese, and potatoes are listed in the November "Poultry Tribune" as satisfactory food materials for use in mixing ANTU rat-poison baits. In the same issue, Noble A. Painter, an Indiana farmer, reports that the best way he has found to kill rats on his farm is to sprinkle an ANTU rodenticide on top of fresh-milk bait.

Mr. Painter says he has seen many articles on how to poison rats, but that when he tried various kinds of rodenticides the rats usually would not eat ordinary poisoned bait because they also had access to plenty of grain. He adds:

"I finally hit upon the fresh-milk method. I feed them fresh milk in many shallow vessels, for about four nights, leaving the same vessel at the same place each night.

"The first night the rats are quite shy, and do not consume much milk. I spill some around the vessel so they can get it easily, and soon they are drinking milk like hogs.

"When they begin to consume large amounts of milk, I act. I put a little of the ANTU poison on top of the milk. It sure mows them down. Usually, I get most of the rats that are old enough to leave their nests the first night. Then after a few weeks I again bait to clean up the remainder. This is the best method I have ever used."

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NEW "CERESAN" M DRY SEED DISINFECTANT, PRACTICALLY ODORLESS, GREATLY REDUCES HAZARD OF SKIN IRRITATION TO PERSONS HANDLING IT

A long-sought dry seed disinfectant that is practically odorless and, when properly handled, greatly reduces the hazard of irritation to the skin of persons using it has been developed by the Du Pont Company.

It is "Ceresan" M seed disinfectant, now being recommended for use against numerous seed-borne and soil-borne crop diseases, including seed-borne anthracnose, angular leafspot, seed decay, and seedling damping-off of cotton.

The active ingredient of this new material is ethyl mercury p-toluene sulfonanilide, which has been successfully tested by state agricultural experimental stations over a period of years under the temporary designation of #1452-F.

"Ceresan" M, recently made available commercially, is already finding favor among commercial treaters, particularly for custom treating of cotton seed. It can be used in any equipment that insures complete coverage of seed, including both commercial mechanical treaters and homemade rotary drums.

More Agreeable To Work With

Other seed disinfectants, including New Improved "Ceresan" and 2% "Ceresan", have given excellent results. However, because "Ceresan" M is more agreeable to work with, this new material is expected to largely replace these older products during the next year or so for use as a dry disinfectant for wheat, oats, barley, rye, millets, flax, peas, sorghums, whole or sheared sugar beets, and both fuzzy and delinted cotton. Properly applied at the rate of not more than 1½ ounces per 100 pounds, it is recommended by some authorities for treating shelled peanut seed, but Du Pont plant pathologists continue to prefer "Arasan" tetramethylthiuram disulfide seed disinfectant for treating this crop.

It is hoped that enough of the new material will be available for the next year to help fill the growing demand for chemicals to control or reduce numerous economically important diseases of other crops, in addition to cotton. It is recommended by experiment stations for control of grain diseases such as covered smut, black loose smut, and stripe of barley; smut and Helminthosporium blight of oats; stem and covered smuts of rye; loose and covered kernel smuts of sorghums; and stinking smut of wheat. It also reduces seed decay and seedling damping-off of flax, peas, and sugar beets.

Promising research on the application of this new disinfectant by the new slurry method is underway, but recommendations are being withheld until more definite information is available.

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DU PONT SPREADER-STICKER KEEPS "ARASAN" SF, APPLIED TO SEED CORN BY SLURRY METHOD, FROM BECOMING LOOSENED DURING SUBSEQUENT HANDLING

Research workers in the Du Pont Semesan Laboratory have found a suitable adhesive or sticking agent to make "Arasan" SF tetramethyl thiuramdisulfide seed disinfectant adhere more firmly to seed corn after application by the slurry method.

It is Du Pont Spreader-Sticker, long used as an adhesive for spray fungicides and insecticides. This product not only causes the chemical to hold fast to the treated seed, but does not influence the planting rate nor injure the seed itself. It is also readily obtainable by the trade, inexpensive, and easy to use.

The studies were undertaken following reports from seed processors last year that small amounts of the "Arasan" SF, applied to protect the seed against decay and seedling blight of corn, became loosened during stacking and subsequent handling, the resultant dust causing some discomfort to workmen.

Various compositions, each at several concentrations, were tested for adhesive properties, and Du Pont Spreader-Sticker was deemed most suitable. The minimum effective concentration for use with "Arasan" SF slurry was found to be 2 per cent by volume, equivalent to 1 pint of the spreader-sticker to 6 gallons of the slurry. The slurry itself is made by adding the powdered "Arasan" SF to water at the rate of 1 pound to 1 gallon of water. Each gallon of slurry will treat about 32 bushels of seed corn by the slurry method, which requires the use of a special slurry treater that provides a rapid, dust-free, accurate, and thorough method of treating corn.

How To Add Spreader-Sticker to Slurry

"In practice the slurry is prepared in the usual manner, and the spreader-sticker is then poured into the slurry tank with the agitator running," according to Gilbert F. Miles, plant pathologist in charge of the Semesan Laboratory. "It is preferable to distribute the spreader-sticker over the surface of the slurry instead of dumping it in one spot. The operator should wait a couple of minutes before beginning to treat the seed to permit the sticker to mix with the slurry."

Amount of Flying Dust Reduced By 90 to 95 Per Cent

Mr. Miles and his associates found that addition of the spreader-sticker to the slurry substantially reduces the amount of dust, dislodged from the seed, that escapes through the sack into the air. They estimate this reduction in the amount of flying dust at about 90 to 95 per cent.

Continued on next page

Use of Spreader-Sticker Does Not Have Any Harmful Effects

"In planter drop-tests, addition of the spreader-sticker did not reduce the rate of drop," Mr. Miles says. "This was true even when the treated seed was held at 87 to 90 per cent relative humidity just prior to the tests.

"The results of field experiments conducted during 1947 show that the use of the spreader-sticker does not influence the effectiveness of the seed treatment, nor does it have any deleterious effect on the seed itself."

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PACKING COMPANY OFFERS REWARD FOR FLIES FOUND IN PLANT

A reward to anyone who can find flies in the company's plant has been offered by the Tilghman Packing Company of Tilghman, in Talbot county on the Eastern Shore of Maryland.

"Our company is now offering $10 to anyone who can find ten flies in our crab, fish, and canning plants, warehouse, or machine shop at any time," according to George T. Harrison, president of the company. "As yet, no one has qualified for the award. The entire plant and surrounding territory have been sprayed with DDT insecticide."

The Tilghman Packing Company packs fresh shucked oysters and crabmeat, and ships Chesapeake Bay fresh fish. It also cans shad and shad roe, mackerel and mackerel roe, herring and herring roe, trout, silver hake, corn, and tomatoes.

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U. S. D. A. AND OTHER ORGANIZATIONS CALL FOR 20,000,000 HOME GARDENS

"Home vegetable gardening will be renewed next season on the same full scale as in war time, under plans sponsored by the National Garden Institute, National Council of State Garden Clubs, Men's Garden Clubs of America, and Secretary of Agriculture Anderson," says the December issue of the "AIF News."

"The minimum goal set is 20 million gardens for 1948," it says. "Object is to 'remobilize the Victory Gardeners' so that 'the produce from these gardens can take the place of many foods vitally needed for export.' An added urgent argument is the cost of living; millions of gardeners remember the savings from home-growing food."

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METALLI-CHROME -- NEW DURABLE, TRANSLUCENT LACQUER FINISH

Farm people and others whose lusterless old automobiles sadly need repainting can now have their local refinisher apply a new, durable, translucent finish that glows with a glittering "fire" inherent in the lacquer. This new finish, which is also being used by manufacturers on some new cars, is believed to surpass in beauty and service any coating yet to appear.

It is the recently released Du Pont finish called "Duco" Metalli-Chrome lacquer, now available in a variety of colors with such intriguing names as thundercloud gray, lunar brown, star dust beige, solar gold, nimbus green, ursa green, cumulus green, meteor gray, Jupiter blue, and altus green.

Based on a new pigment technique, utilizing new pigment materials, the revolutionary Metalli-Chrome finishes provide startling rich, lustrous colors and color effects heretofore impossible to achieve, plus outstanding durability characteristics.

Light Reflected From Underneath Instead of From Outer Surface

Du Pont Finishes Division experts say the rich, deep-glowing effect results from the high degree of translucency of the film. "Unlike a conventional finish," they explain, "light actually penetrates deep into Metalli-Chrome, where it is diffused and reflected by millions of tiny particles of metallic aluminum which act as tiny mirrors. These translucent metallics, moreover, present to the eye a startling color variation as the lighting alters or the angle of vision shifts."

Durability Tested For Year In Florida's Intense Sunshine

Discussing the remarkable durability of the new finishes, the Du Pont authorities explain that "exposed for a year in the ultra-violet laden Florida sunshine, their color fastness and film integrity are so nearly perfect that it is difficult to distinguish between exposed and unexposed test panels."

Basically the Result of Two Discoveries

The new finishes are basically the result of two discoveries: (1) the method of transferring water-wet pigments to a lacquer vehicle without intermediate drying of the pigment, and (2) the unusual color effects and durability obtained with certain new pigment combinations. Explaining how the distinctive soft, inner glow results from the small particle-size of the pigments used, the Du Pont research workers say:

Continued on next page

"On the average it would take about one-half million of the pigment particles used in Metalli-Chrome, side by side, to measure a single inch. The lustrous depth that characterizes the new lacquers is further enhanced by the presence in the film of aluminum particles that act as millions of minute mirrors to bounce the light around inside the finish -- and thus diffuse it -- before reflecting it back to the eye. While there is nothing new about employing aluminum particles in this manner in so-called metallic coatings, their function as mirrors was previously extremely limited because opaque pigmentation prevented light from penetrating more than the top surface of the film."

How Metalli-Chrome Was Born

Metalli-Chrome was developed in the same laboratories at Parlin, N. J., which first introduced "Duco" in 1923. The roots of the development were implanted in 1935 with research resulting in the first "Duco" metallic colors. The evolution of metallics continued with the advent of translucent metallic maroons and blues between 1937 and 1939.

A team of research chemists, led by Robert T. Hucks, who developed a radically new process for dispersing pigments in lacquers, began an intensive study of application of this process to a variety of coloring materials -- thus starting the long experimental trail that led to Metalli-Chrome. They explain:

"Normally, pigments used in modern finishes are the product of chemical synthesis. Many of them are precipitated from chemical solutions in the form of fine, wet particles, which are then dried and ground.

"Although mechanical grinding produced pigment particles of extreme fineness, it had long been known that the particles were actually much smaller while still in water suspension. Chemists worked for many months to develop a means whereby the particles could be transferred from their original suspension directly to lacquer base without drying.

"The successful evolution of such a process meant that pigment could be distributed through a "Duco" lacquer in the form of particles actually smaller than the wave-length of light -- so small that up to 30,000,000 of them would be contained in one square inch of paint film!

"Pigments in conventional metallics are opaque and of relatively large particle size. They block the passage of light rays. But pigment particles in Metalli-Chrome finishes, being smaller than a wave-length of light, allow light rays to penetrate the finish, where they are refracted and dispersed by millions of tiny aluminum mirrors before being reflected to the eye. The effect is a depth of colors, the creation of a warm, inner glow that is actually the result of light reflected from within the finish itself."

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TWO WAYS IN WHICH BARK BEETLE SPREADS DUTCH ELM DISEASE

"Inoculation of the Dutch elm disease is effected by the feeding on twigs of living elms by adults of the European elm bark beetle," according to D. E. Parker and B. H. Wilford of the U. S. Department of Agriculture's Bureau of Entomology and Plant Quarantine. "Spread of the fungus also results from the dispersion to new areas of beetles that have been developed in dead and dying elm. These beetles, some of which may be carrying the disease organism, develop broods in dead or decadent elm. This may establish reservoirs of the fungus that lives as a saprophyte in elm wood several years before any growing trees show symptoms of the disease. (A saprophyte is any organism living on dead or decaying matter.)

"Therefore, any program of control must be designed to protect trees from the feeding by the beetles and to prevent the development of populations of beetles in decadent wood."

DDT SPRAYED ON LIVING ELM TREES OR DEAD WOOD HELPS REDUCE SPREAD OF DUTCH ELM DISEASE BY KILLING BARK BEETLES THAT CARRY DISEASE ORGANISM

Further spread of the Dutch elm disease, first discovered in this country in Ohio in 1930 and in more recent years in New England, can be greatly reduced by use of DDT to kill the bark beetles that carry the destructive organism causing the ailment.

Research workers have found that the living trees, properly sprayed, can be protected from the attacks of the beetles. They also recommend use of DDT on dead or dying elm wood to prevent infestation, or to destroy beetles already in the wood. In cases where it is desirable to save the wood for fuel purposes this is essential.

Seriousness of the disease in some areas is indicated by the following figures for Massachusetts: The first case was identified in 1941. Six more were discovered in 1942; four in 1943; 32 in 1944; 42 in 1945; 296 in 1946; and 630 to the end of October 1947. Even heavier infestations have been found in Connecticut, New Jersey, and New York.

"It was not until DDT became available that there appeared to be any hope of using insecticides to protect living elm trees from inoculation by the bark

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beetles," D. E. Parker and B. H. Wilford of the U. S. Bureau of Entomology and Plant Quarantine recently told the Massachusetts Tree Wardens and Foresters' Association.

"Research during the last several years has demonstrated that an emulsion* containing 2 per cent of DDT, properly applied, will kill the adults before they can make feeding injuries that might serve as infection courts," they said. "This has been thoroughly demonstrated on small elm trees under field conditions, and several formulations were tested extensively on large elms this past season. We feel certain that, when the mechanics of application on large trees is solved, two sprays during a season will protect the trees during the period of activity of the beetles."

The government entomologists said DDT for elms in dormant condition may be applied as a 2% emulsion in the spring before buds burst to control emerging early broods of bark beetles. This spray may be followed by a 1 per cent emulsion, properly applied about July 15 to control beetles emerging during the summer. The spray can be applied with ordinary high-pressure spray apparatus of sufficient power to deliver spray to the tops of the trees.

They first reported that a 2 per cent solution of DDT in oil has proved effective for treating dead and dying elm wood, either infested or noninfested by bark beetles. Subsequent tests, however, have shown a 1 per cent solution to be sufficiently strong. The entomologists emphasize that use of the oil spray applies only to dead or dying trees. It will injure living trees and nearby plants.

Elm wood in suitable condition for attack can be rendered unsuitable by thorough spraying with such an oil solution. Elm wood harboring developing broods of bark beetles can also be treated in this manner, making it unnecessary to destroy the wood to prevent the emergence of beetles.

Things That Must Be Done to Control Dutch Elm Disease

The Bureau recommends prompt removal and burning of all cut elm wood, whether killed by the disease or not, unless it is sprayed with DDT. Before May 1 prune and burn all recently dead material from elms. Do not pile unsprayed elm wood in the open during the summer, and do not permit dumping of unsprayed elm wood with bark in city dumps, which are common sources of disease outbreaks. Don't transport elm wood with bark attached. In all contracts involving the cutting of elm trees, require the burning or other satisfactory disposal of all elm wood removed. Spray elms to control leaf-eating insects. Keep elms as healthy as possible. And enlist the support of all municipal departments as well as civic groups and public utilities in the detection and removal of diseased and dead elms.

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*In finished emulsions the DDT is dissolved in a solvent and an emulsifying agent is added. When this is put in water a milky appearing emulsion is formed. On the other hand, DDT actually dissolves in a suitable oil medium, giving rise to a clear solution.

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CHIEF PRODUCTS OF SOUTHERN PINE ARE TURPENTINE AND ROSIN

"Production of naval stores is a $40,000,000-a-year industry.

"Pitch and tar, the original crude products from pine sap, or gum, were called 'naval stores' because they were used for calking ships. The chief products of southern pines are now turpentine and rosin, obtained by distilling the gum, but the old name has stuck. By distillation, the turpentine is released as vapor, which is carried off, leaving the non-volatile rosin in liquid form. On cooling, turpentine becomes liquid and rosin becomes solid.

"The turpentine is used as a thinner for paints and varnishes and in shoe polish, synthetic chemicals and resins, and pharmaceuticals. Rosin goes into paper sizing, varnish, plastics, soap, printing ink, linoleum, sealing wax, and rubber goods."------
U. S. D. A. "Research Achievement Sheet" No. 80(C)

GUM-CLEANING METHOD DEVELOPED AT FLORIDA NAVAL STORES STATION

By M. H. Bruner

Development of a new gum-cleaning process in which oxalic acid is used to remove iron stain has "made pine gum an ideal cash crop for the farmers of the naval stores region," according to research scientists at the Olustee, Florida, Naval Stores Experiment Station of the Bureau of Agricultural and Industrial Chemistry, U. S. Dept. of Agriculture.

Use of oxalic acid is an important step in what is known as the "government process," originated by the Bureau at the Florida location.

A recent "Research Achievement Sheet," No. 80(C), issued by the U. S. Agricultural Research Administration, explains that the new central gum-cleaning plants that have resulted from the development of the cleaning process make it possible for farmers to collect and sell gum during nine or ten months of the year. They point out that "if other farm work is more pressing, collection can be postponed without appreciably decreasing the quantity of gum obtainable from the trees."

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Pine Needles, Bits of Bark, Other Trash Removed from Gum

The need for cleaning results from the fact that the gum, as collected from the trees, contains pine needles, bits of bark, and other trash. It is also frequently discolored by iron stain from rusty iron gum-collecting cups.

"In the new method, the gum is diluted with about one-third its volume of turpentine, melted, and then strained and filtered," the "Research Achievement Sheet" says. "Hot water is mixed with the filtered gum to remove water-soluble material. After standing a while, water and thinned gum separate, and the water is drained off."

Iron Stain Must Be Removed To Obtain Desirable Brilliance

The report adds that this method of cleaning, however, does not remove iron stain.

"To obtain the desirable brilliance, pale rosin from gum that has been contaminated with iron, the stain must be removed," it explains.

"It has been found that treatment with oxalic acid effectively removes iron stain, because the acid reacts with iron to form iron oxalate, which can be easily filtered or washed out. The preferred procedure is to add a few ounces of acid to a barrel of gum while the gum is being melted.

"The use of oxalic acid for the removal of iron stain is especially adapted for use with the Government cleaning process in which the excess acid is removed in the water-washing step. At least two-thirds of the gum-cleaning plants now employ the Government process under license from the Secretary of Agriculture, and many of these plants use the oxalic acid treatment in connection with it. The resulting rosin is generally several grades lighter in color than that from uncleaned gum, and the paler the rosin the higher the price it brings."

Water Residue Removed by Passing Turpentine Through Salt

The report also describes another improvement in the process which results in clear, sparkling "dehydrated" gum turpentine as a result of removal of water left after distillation and condensation. This water clouds turpentine in bottles and often causes discoloration in cans and drums.

"Investigators found that passing the turpentine through a bed of rock salt before it is packaged removes the water and leaves the turpentine clear," it says.

Research Worth Many Millions of Dollars

George P. Shingler, in charge of the Naval Stores Station, Olustee, Florida, and E. L. Patton, head of the Naval Stores Research Division, New Orleans,

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La., who prepared the report, estimate that the research, which cost about $182,000, has been worth about $18,000,000 through 1946, "through increased yields, improved grades of rosin, and better quality of turpentine." They point out that the number of gum-cleaning plants in Georgia and northern Florida increased from 4 in 1940 to 25 or more in 1946. They add:

"Formerly, operators of stills processed chiefly gum from their own trees; and owners of small tracts of pine, having no market for gum, often did not work their trees. The new gum-cleaning plants take all the gum brought in, and as a consequence more farmers sell gum as a cash crop. The central gum-cleaning plants have also been responsible for improving the quality of rosin. Before 1940, less than one-fifth of the gum rosin produced was in the three top grades; now nearly half is in these grades."

NOTE: Those interested in additional information on the processes described above are invited to write or visit the Naval Stores Station at Olustee, Florida, or the laboratories of the Naval Stores Research Division, New Orleans, La.

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EVERY FARM HOME IN ONE ARKANSAS COUNTY SPRAYED WITH DDT. MALARIA AND DYSENTERY DISAPPEAR FROM 100-HOME PLANTATION

A DDT-spray program among the tenant houses on the Burdette Plantation near Blytheville, Arkansas, resulted in healthier farm hands, according to Cris Tompkins, plantation manager.

Mr. Tompkins recently told County Agent Keith Bilbrey: "We haven't had a case of malaria or dysentery on our place this year. In some past years we have had lots of both."

The Public Health Service, cooperating with farmers in Mississippi County, Arkansas, sprayed every farm home in the county at least once and some twice this past summer to kill malaria-carrying mosquitoes and dysentery-carrying flies. The homes of the 100 families on the Burdette Plantation were among those sprayed.

"Our commissary is just about out of the business of selling chill tonic," Mr. Tompkins added.

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Agricultural News Letter Du Pont
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ICELESS REFRIGERATOR CAR UTILIZING ANHYDROUS AMMONIA MAINTAINS ZERO TEMPERATURE UNDER SUMMER CONDITIONS DURING 10-DAY TEST

The interiors of iceless refrigerator cars, using anhydrous ammonia as the refrigerant, can be held at sufficiently low temperatures under outside summer conditions to maintain the prime quality of frozen foods during rail transit of such perishable farm products.

Tests begun in 1947 indicate that an iceless car can maintain temperatures of approximately zero degrees F., when the outside temperature is 92 degrees F. The low temperature created by the anhydrous ammonia cannot be reached by the ordinary refrigerator car stocked with the usual blocks of ice.

These are among the findings of research engineers of the U. S. Department of Agriculture and other interested groups studying ways to improve refrigeration of farm products during rail shipment from areas of production to consumer points.

In their studies, these scientists used a car having 3-inch insulation and equipped with a split-absorption system of refrigeration, which they say is an adaptation of a well-known method. Tanks attached to the underframe of the car hold the anhydrous ammonia, under pressure. The scientists in their reports emphasize the fact that the split-absorption system is the only mode of refrigeration that lends itself to controlled temperatures, essential to maintain frozen foods in their original frozen state.

How Cooling Is Achieved

"Cooling is achieved as the ammonia moves from the tanks through a single regulating valve, and expands in the cooling coils located in the ceiling of the car," they say. "When the ammonia has completed its refrigerating effect, it is finally taken up by water in absorber tanks also attached to the underframe of the car. There are no moving parts."

In the first experiments, the ammonia consumption during the test period, February 11-21, averaged 42 pounds per hour. During the tests, a single charge of anhydrous ammonia lasted 46 hours.

Tests Conducted With Car Loaded With Frozen Tangerine Segments

The tests, conducted in a car-testing laboratory at Potomac Yard, Alexandria, Va., were made with a car loaded with cartons of frozen tangerine segments. Immediately after the test-car was placed in the test house, the air temperature inside the house was brought quickly to about 92 degrees F. and maintained at that temperature for the entire ten days of the experiment.

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The temperature of the air and of the frozen tangerines inside the car was determined every two hours through the test by means of remote-reading thermocouples and electric-resistance thermometers which allowed temperatures to be read without opening the car door. Test-house temperatures were also taken every two hours.

Load Still Hard-Frozen When Removed At End of Test

During the ten-day period, the temperature of the frozen tangerines at the top of the load averaged from 4 degrees below zero to 1 degree above zero. At the bottom of the load, temperatures ranged from 3 degrees below to 3 degrees above zero.

"Improved wall and floor racks, allowing a freer circulation of air, would undoubtedly narrow the spread between commodity temperatures at the top of the load and those at the bottom of the load," the federal workers assert.

"The load of tangerines was hard-frozen when placed in the car. It was still hard-frozen when removed at Jersey City, N. J. at the end of the test period."

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COWS IN ARKANSAS, SPRAYED WITH DDT DURING FLY SEASON, INCREASE AVERAGE MILK OUTPUT MORE THAN 2 POUNDS DAILY

When the summer fly season ended in Boone County, Ark., dairymen checked their records, and were surprised to learn what large dividends they had received as a result of spraying their herds with DDT insecticides, according to County Agent Roy C. Keeling of Harrison.

The survey showed 88 cows picked at random had increased their daily output of milk 179.8 pounds. The county agent figures $8.80 per month spent for spraying produced $178 additional income.

He reports 150 dairymen in the county sprayed their cattle regularly, using a power sprayer made available by the state veterinarian, the Farm Bureau Federation, and the county Extension office.

BOOKLET DISCUSSES USE OF DDT TO CONTROL FLIES ON DAIRY FARMS

Really effective control of flies on dairy farms was largely impossible until DDT came along, says a new booklet, "The Use of DDT In the Control of Flies on Dairy Farms," containing procedures formulated by Dr. H. H. Schwardt, Cornell entomologist.

While prepared especially for New England, New Jersey, Pennsylvania and New York (New York milk shed) conditions, the circular is receiving widespread attention throughout the country because the general principles presented are applicable most anywhere.

The publication says that with DDT, now available in forms suitable for both animal and barn spraying, dairymen have an inexpensive means of "reducing flies to almost insignificant numbers."

Offered In Interest of Better Fly Control in Dairies

"This circular is offered in the interest of better fly control in dairies of the New York milk shed, and in the hope that all dairymen will begin the routine use of DDT in their barns," says the publication, which is sponsored by the Departments of Health in New York City and state, New Jersey, Jersey City, Newark, Westchester and Nassau counties, N. Y., Connecticut Dairy and Food Commission, and Vermont Department of Agriculture. The Milk Dealers' Association of Metropolitan New York has printed 100,000 copies for distribution, at cost, to operators of country milk plants. (For a copy, write Jerome Trichter, Director, Bureau of Food and Drugs, Department of Health, 125 Worth St., New York 13, N. Y.)

Wettable Powder Recommended for Most Uses

The circular says both the wettable powder and the emulsion forms of DDT are suitable for use in barns, but that the wettable powder is the more practical material except on varnished natural wood or gloss paint. It leaves a slight residue that may be objectionable on highly finished walls.

The recommended amount of wettable powder, containing 50 per cent of DDT, ranges from six to ten pounds to make 100 gallons of spray. For heavy infestations such as develop in New Jersey, ten pounds are suggested, whereas "the six-pound dosage will be adequate in the New England States."

"The powder should first be mixed into a thin paste in a small amount of water, then added to the spray tank," the circular says, "This spray should be applied to walls and ceilings in sufficient amount to wet them thoroughly without allowing any runoff. One gallon will cover about 300 square feet at this rate. The first application should be made in late May, and the second in late July or early August," in the northeastern area.

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Emulsion Preferred for Small Hand Sprayers

The discussion says the fact that DDT wettable powder may settle out of suspension, unless sufficiently agitated, is not important in power sprayers with efficient mechanical agitation. However, in small hand sprayers, some of the DDT may remain on the bottom of the tank after it is emptied.

"DDT in emulsion form overcomes this difficulty," it adds.

Instructions for making such emulsions are included. However, the circular points out that they can also be bought ready to pour into the tank, "and are the ideal form of DDT for use in hand sprayers" after being diluted in water to contain 1 per cent of DDT.

Spraying the Buildings

"Fly control on the farm will be more complete if all buildings that harbor or encourage flies are sprayed inside," the circular says. "Spraying the outsides of buildings will also help, especially spraying vertical walls closely adjacent to a fly-breeding area, such as a spot where manure has been piled, or outside surfaces where masses of flies have been seen to rest on sunny days."

Some precautions suggested: "While spraying a barn the operator should avoid spraying into feed troughs or drinking fountains. There should be no piles of hay or silage on the floor, and the feed troughs should be empty. Cattle should be taken out, because they will be in the operator's way, especially while spraying the ceiling. When spraying milk houses, loose equipment should be removed and fixed equipment covered."

Spraying the Animals

The booklet explains that DDT sprayed on the animals themselves gives excellent protection against the horn fly, because this blood-sucking pest lives on the animal throughout its life, leaving only for short periods to deposit eggs.

"The horn fly is about half the size of the house fly, and will be found clustered on the cow's back and sides or sometimes about the bases of the horns," it continues.

The booklet recommends that, where the horn fly is a problem, the animals be sprayed with the same wettable powder formula used in the barn for housefly control. This is generally six to ten pounds of a wettable powder containing 50 per cent of DDT to make 100 gallons of spray.

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Spraying Equipment

The circular discusses a considerable variety of spraying equipment suitable for applying DDT to barns and animals, adding that "large establishments will find it advisable to buy power equipment capable of handling large areas rapidly," while small dairy operators "can use a hand-operated garden sprayer of the knapsack type."

NOTE: Since recommendations differ for various parts of the country, dairymen might well consult their county agent or other local agricultural authority for specific instructions for their particular area. Write the Grasselli Chemicals Department, Du Pont Company, Wilmington 98, Del., for information regarding Du Pont's various "Deenate" DDT insecticides, including "Deenate" 50-W (wettable powder) and "Deenate" 25-R (emulsifiable oil.)

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FLIERS PICK UP APPLES FROM SPECIAL NYLON-ROPE SLING

A novel use of nylon rope, adapted from airplane mail pickup technique, is reported by Bill Zipf in his "Rural Report" column in the Columbus, Ohio, Dispatch. He says:

"Jackson County, Ohio, orchardists, who farm under the firm name of Richards Brothers and Sons, probably have as novel an apple delivery system as any fruit grower in the nation. All American Aviation, Inc., of Pittsburgh, installed pickup poles similar to those at towns on the mail pickup run between Cincinnati and Pittsburgh. Apples are placed in a special container. The container is placed on a nylon rope between the poles. Pilots dip low to pick up the fruit while planes are traveling at 180 miles an hour. In return for the apples, the airline men drop aprons, candy, and magazines to families of the Richards Brothers and Sons."

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